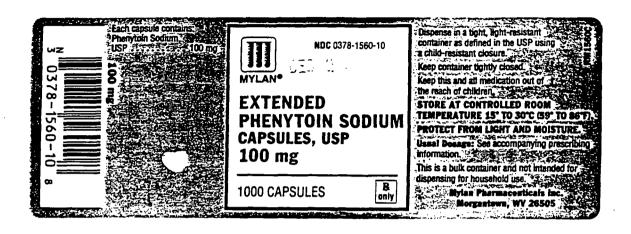
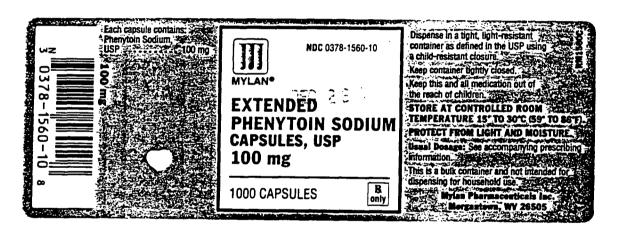
## **CENTER FOR DRUG EVALUATION AND RESEARCH**

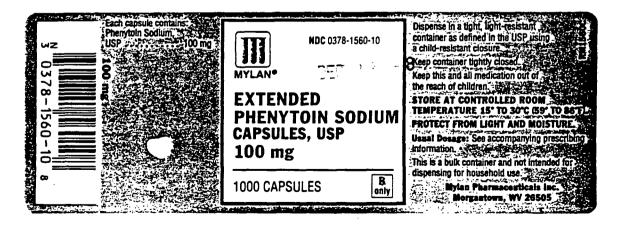
**APPLICATION NUMBER: 40-298** 

## PRINTED LABELING

EXTENDED PHENYTOIN SODIUM CAPSULES, USP 100 mg ANDA 40-298

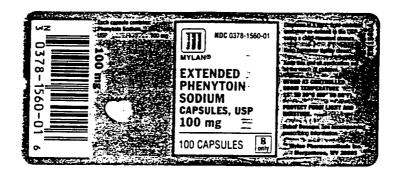


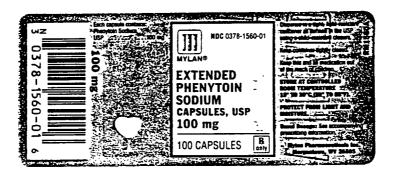


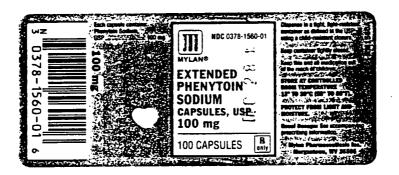


EXTENDED PHENYTOIN SODIUM CAPSULES, USP 100 mg ANDA 40-298











## EXTENDED PHENYTOIN SODIUM CAPSULES, USP 100 mg

B only

DESCRIPTION: Pherryton sodium is an amepieptic drug. Pherryton sodium is resided to the barbrurates in chemical structure. Under a live-membered ring. The chemical name is 5.5-Uiphen-chemical name is 5.5-Uiphen-ythydarton sodium sait, having a molecular weight of 774 92 maying the following structural formula and molecular tormula.

Each extended phenytom sodium capsule, USP, for oral administration, contains 100 mg phenytom sodium. Each capsule also contains the following mactive impredents: black into oxide. Colloidal silicon dioxide. D&C red #28. D&C red #33. D&C yellow in 10 alignmum lake. D&C blue inc. 2 alignmum lake. FD&C blue inc. 2 alig

The plasma half-life in man after oral administration of pheny-tion averages 22 hours, with a range of 7 to 42 hours. Steady-

cortes where spread of secture activity is shibited. Possibly by promoting sodium efflux from neurons, prienvious tends to selected the translation against hyper-excitability caused by excessive stimulation or environmental changes capable of reducing memorane sodium gradem? This includes the reducion of postitution of synapses, and the second section of postitution at synapses. Loss of postitution of synapses to provents concus secure foot from detionating adjacent cortical areas. Phenytion reduces the maximal activity of orain stem centers responsible for the tonic centers responsible for the tonic prised of annic-clonic (grand mail) secures.

secures.

The plasma half-life in man after oral administration of phenytoin averages 22 hours with a range of 7 to 42 hours. Steady-state therapeutic tevels are achieved at least 7 to 10 days (5 to 7 half-lives) after immation of therapy with recommended doses of 300 mg/day.

when serum level determinations are necessary, they should be obtained at least 5 to 7 halfleves after treatment initiation, closage change, or addition or subtraction of another drug to the regimen so that equilibrium or steady-state will have been achieved. Trough levels provided miormation about curically effect into serum level range and conlim patient compliance and are obtained just prior to the patient's next scheduled dose. Peak kivets next scheduled dose. Peak kivets indicate an individual's timeshold for emergence of dose-related side effects and are obtained at the time of expected peak concentration. For extended phenytion sodium capsules peak serum levels occur 4 to 12 hours after administration.

administration.

Optimum control without clinical signs of toxicity occurs more often with serum levels between 10 and 20 mcg/mL, although some mild cases of tonic-clonic (grand mai) epicpsy may be controlled with lower serum levels of phenyton.

phenyton

In most patients maintained at a steady dosage, stable phenytoin serum levels are achieved. There may be wide interpatient variability in phenytoin serum levels with equivalent dosages. Patients with experience of phenytoin. Unusually high levels result from liver disease, congenital enzyme deficiency, or drug interactions winch result in metabolic interference. The patient with large variations in phenytoin plasma levels, despite standard doses, presents a difficult clinical problem. Serum level caterimizations in such patients may be particularly helpful. As phenytoin is highly protein bound, free phenytoin levels may be altered in patients winds protein binding characteristics differ from normal.

Most of the drug is excreted in

Most of the drup is excreted in the bile as inactive metabolities which are then reabsorbed from the intestinal tract and excreted in the urine. Urinary excretion of phenyton and is metabolities occurs partly with glomeruar intra-tion but more importantly by tubular secretion. Because phenyton is hydroxylated in the liver by an enzyme system which is saturable at high plasma levets, small incremental doses may increase the half-life and printernal increases in serum levels, when these are in the upper range. The steady-state level may be disproportionately increased, with resultant increases in dosage of 10% or more.

INDICATIONS AND USAGE: Extended pnenyton sodium capsules are indicated for the control of generalized tonic-clonic (grand mail) and compilex partial (psychomotor; temporal lobe) sezures and prevention and treatment of setzures occurring during or following neurosurgery or following neurosurgery

Phenyton serum level determinations may be necessary for optimal dosage adjustments (see DOSAGE AND ADMINISTRATION and CLINICAL PHARMACOLOGY sections).

CONTRAINDICATIONS: Phenytoin is contraindicated in those patients with a history of hypersensitive to phenytoin or other hydantoins

WARNINGS: Abrupt withdrawal of phenytoin in epileptic patients may precipitate status epilepticus when in the judgment of the

or tollowing field (Surfice)

Phenytour serum level de nations may be necessary for optimal dosage adjustments (see DOSAGE AND ADMINISTRATION and CLINICAL PHARMACOLOGY

CONTRAINDICATIONS: Pheny to a heavy to phenyton or other

WARNINGS: Abrupt withdrawal WARNINGS: Abrupt withdrawal of prenytion in epidernic patients may precipitate status epidephous. When, in the judgment of the christan, the need for docage reduction, discontinuation, or substitution of atternative anne

drug not belonging to the rysual tron chemical class.

There have been a number of reports suggesting a retanonship between prenytion and the devel-opment of lymphadenopathy (local or generalized) including beingin ymph node hyperplasia, pseudolymphoma, lymphoma, and Hoogdim's Disease. Almough a cause and effect relationship has not been established, the oc-currence of lymphadenopathy included the companies of such a condition from other types of lymph node pathology. Lymph no without supplicits and supplicits resembling serum sickness. (d.) tever, rish, and liver involvement. In all cases of lymphadenopathy in all cases of lymphadenopathy.

پینی میں: مستح این داران مارک این داران

tever, rash, and liver involvement. In all cases of lymphadenoparty, follow-up observation for an extended period is indicated and every effort should be made in actives excure control using alternative amenoientic drugs.

Acute alcoholic make may increase phenytom serum levels while chronic alcoholic use may decrease serum levels.

In yew of solated reports as-

In view of isolated reports as-sociating phenytoin with exacer-bation of porphyria, caution should be exercised in using this medication in patients suffering from this disease.

trom this oisease.

Usage in Pregnancy: A number of reports suggests an association between the use of antiepileotic drugs by women with 
epileotic and another more extensive with respect to phenyton 
and phenobarbital, but these are 
also the most commonly prescribed amtepileotic drugs; less 
systematic or anecdotal reports 
suggest a possible similar association with the use of all known 
antepileotic drugs.

ation with the use of all known ambepileptic drugs.

The reports suggesting a higher incidence of birth defects in children of drug-treated enleptic women cannot be regarded as adequate to prove a definite cause and effect relationship. There are ministic methodologic problems in obtaining adequate data of drug teratograticity in humans; genetic factors or the epiteotic condition itself may be more important than drug therapy in leading to birth defects. The great majority of mothers on antiepileptic medication deliver normal inflants, it is important to the secure does not the secure disorder are such that the removal of medication does not pose a senious finest to the patent. discontinuation of the drug removal of medication does not pose a senous threat to the patient. discontinuation of the drug may be considered prior to and during pregnancy, although it cannot be said with any continuence that even minor setzures do not pose some hazard to the developme embryo or fetus. The do not pose some hazard to the developing embryo or tetus. The prescribing physician will wish to weigh these considerations in treating or counseling epileptic women of childbearing potential, in addition to the capacit of the capacity o

in addition to the reports of increased incidence of congenital malformation, such as cleft inp/palate and heart malformations in children of women receiving phenytion and other anti-poleptic drugs, there have more recently been reports of a fetal hydamion syndrome. This consists of prenatal growth dencency, microcephaly, and mental de-

cerving prierytoin and other anti-epileptic drugs, there have more recently been reports of a tetal nydantoin syndrome. This con-sists of prenatal growth dehoen-cy, microcephaly, and mental de-toiency in chadren born to motivers who have received phenytom, barburares, alcohol, or trimetha-dione. However, these features are all interrelated and are fre-quently associated with intrauterune arowth retardation from other

There have been isolated reports of malignancies, including neuropastoma, in children whose mothers received phenytoin durang pregnancy.

movers roughly and preparately an preparately an increase in accure frequency during pregnancy occurs in a high proportion of patients, because of altered phenytoin absorption or metabolism. Periodic measurement of serum prenytoin levels is particularly valuable in the management of a pregnant levels is particularly valuable in management of a pregnant epileptic patient adjustment of ossappropriate adjustment of ossappropriate adjustment disage will anon of the organic dosage will are observed the probably be indicated.

also of the original dosage will probably be indicated probably be indicated. Noonatal coagulation defects have been reported within the first 24 hours in babies born to epileptic mothers receiving phi, nobarbital and/or phenyloin. Vitamin K has been shown to prevent or correct this defect and has been recommended to be given to the mother before delivery and brownauro of phenyloin. Patients with impaired liver function, electry patients, or mose who are gravely ill may show early signs of loopcry.

A small percentage of individuance in the page has been treated with

of toxocity.

A small percentage of individuals who have been treated with phenyto have been shown to metabolize he drug slowly. Slow metabolize he drug slowly. Slow metabolize he drug slowly. Slow metabolize have been slowly and lack of induction; if appears to be genetically determined.

Phenytoin should be discontin-

cally determined.

Authorition in appears to be genetically determined.

Phenytian should be discontinued if a skin rash appears (see WARNINGS section regarding drug discontinuation). If the rash is extolative, purpure, or buildows, or if lupus erythematosus. Stevens-Johnson syndrome, or touce epidermal necrolysis is suspected, use of this drug should not be resumed and atternative therapy should be considered. (See ADVERSE REACTIONS section.) If the rash is of a milder type (measies-like or scariation-torm), therapy may be resumed after the rash has complety disappeared, if the rash recurs upon reinstitution of therapy. Further phenytoin medication is contraindicated.

traindicated.

Phenytoin and other hydantoins are contraindicated in partients who have experienced phenytoin hypersensitivity. Additionally, aution singuid be exercised if using structurally similar compounds (e.g., Darbiturates, succinamides, Oxazolidinadiones and other related compounds) in these same patients.

Hyperplycemia, resulting from

Hypergycema, resulting from the drug's inhibitory effects on insulin release, has been reported. Phenyloom may also raise the serum glucose level in diabetic patients.

Osteomalacia has been associated with phenyloin therapy and is considered to be due to phenyloin's interference with Vitamin D metabolism.

Phenyton is not indicated for sezures due to hypoglycemic or other metabolic causes. Appropri-ate diagnostic procedures should be performed as indicated phenytain is not effective for

Phenyloin is not effective for absence (petit mai) seizures, if tonic-clonic (grand mai) and absence (petit mai) seizures are present, combined drug therapy is needed.

needed.

Serum levels of phernyton susSerum levels of phernyton sustained above the optimal range
may produce confusional states
referred to as "defirium." "psychosis," or "encephalopathy," or
rarely interestable cerebellar dysfunction. Accordingly, at the festels are recommended. Dose
reduction of phernyton therapy is
indicated if plasma levels are
excessive; if symptoms persist,
termination is recommended.

(See WARNINGS section.)

5

intermation for Patients: Patients stang premision should be advised of the importance of achering strictly to the prescribed costop regimen, and of informing the physician of any climical condition in which it is not possible to take the drug orally as prescribed, e.g., surpery, etc. Patients should also be cau-

Patients should also be cautioned on the use of other drugs or alcoholic beverages without first seeking the physician's advice.

Patients should be instructed to call their physician if sion rash develops.

The importance of good dental hygene should be stressed in order to minimize the development of gingival hyperplasia and its complications.

its complications.
Laboratory Tests: Phenytom senum level determinations may be
necessary to achieve optimal
dosage adjustments.
Drug lateractions: There are
many drugs which may increase

Drug taleractions: There are many oncy which may encrease of decrease phenyton levels or which phenyton may affect. Serum level determinations to phenyton are especially helpful when possible drug interactions are suspected. The most commonly occurring drug interactions are tisted below.

- toris are used occur.

  Drugs which may increase phenytoin serum levels include: acute alcohol intake, amodarone, chloramphenicol, chloramphenicol, chloramphenicol, chloramphenicol, editoriarepoxide, diazepam, estrogens, ethosummide, Hy-amagonists, halothane, isomaco, calicytates, succinamides, succinamides, succinamides, uniformatides, tra-rodone.
- rodone.

  2. Orugs which may decrease phenytom levels include: carbamazepine, chronic alcohol abuse, resemme, and sucratate. Mobar<sup>6</sup> brand of molindone hydrochloride contains calcium ons which interfere with the absorption of phenytoin and antacid preparations containing calcium should be staggered in patients with low serum phenytoin levels to prevent absorption problems.

  3. Drugs which may either in-
- 3. Drugs which may either increase or decrease phenyloin serum levels include; phenobarbital, sodium valoroate, and valproi; acid. Similarly, the effect of phenyloin on phoba pital, valoroic acid ar um valoroate serum le sumoreoctable.
- Atthough not a true drug interaction, tricyclic antidepressams may precipitate sezures in susceptible patients and phenytoin dosage may need to be adjusted.
- Drugs whose efficacy is impaired by phenytoin include: corticosteroids, coumnin anticoagularis, digitown, doxycycline, estrogens, furosemide, oral contraceptives, quimdine, rriampin, theophyltine, vitamin D.

me, vitamus D.

Prag/Laboratory Test Interactions: Phenytoin may cause
decreased serum levels of protem-bound iodine (PBI). It may
also produce lower than normal
values for dexamethasone or
metyrapone tests. Phenytoin
may cause increased serum levets of phoose, alicalme phosphatase, and gamma plutamyt transpeptodase (GGT)

Carcinogenesis: See WARN-INGS section for information on carcinopenesis.

Pregnancy: See WARNINGS section.
Nursing Mothers: Infant breast

Marsing Mothers: Infant breast teeding is not recommended to women taking this drug because phenytion appears to be secreted in low concentrations in human milk

ADVERSE REACTIONS: Central was bystem: The most common man

ADVERSE REACTIONS: Central Management of the most common manifestations encountered with phenyton therapy are infertable to this section of the section of t

ADVERSE REACTIONS: Centra Mervees Bystem: The most common manifestations encouncommon maintestations encoun-tered with phenytion therapy are reterable to this system and are usually dose-related. These in-clude nivitagmus, atoms, surred spech, decreased coordination, and mental confusion. Duzinies, incomma, transient nervosiness, motor weachers, and headaches motor tweenings, and headaches have also been observed. There have also been rare reports of hermton induced dvistinessas including chorea, dvistona, tremor and asterous, similar to those induced by the nothing and other neurolephic drugs. motor twechings, and headaches

other neuroleptic drugs
A predominantly sensory persheral polyneuropathy has been
observed in battents receiving
long-term phenytoin theraby
Gestrovietestical System: Nauneuroline, constitution, touc
hepatitis and iver damage.

incipaluis and over camage, integumentary System: Derma-tological manifestations some-times accompanied by tevel have included scartaneodorm etc. morbilitions raches a morbiliti. morbilitorm rashes A morbilis morbilitorm rashes A morbil-torm rash (measles-whee) is the most common: other types of dematris are seen more rarely. Other more senous forms which may be tatal have included bui-lous, extolative or purpunc de-matris, lupus enythematosus. Stivens-Johnson syndrome, and toxic epidermal necrolysis (see PRECAUTIONS section).

tunic epidermal necrolysis (see PRECAUTIONS section).

Memopoletic System: Hemoporetic complications, some fatal, have occasionally been reported in association with administration of pnenytoin. These have included thrombocytopenia, et al., a granulocytosis, and pancytopenia with or without bone marrow suppression. While macrocytosis and megaloblastic anemia have occurred, these conditions usually respond to folic acid therapy. Lymphadenopathy including benign lymph node hyperplasia, pseudolymphoma, hymphoma, and Modgkin's Disease have been reported (see WARNINGS section).

WARNINGS section).
Coansective Tissue System:
Coansening of the tacal teatures,
entargement of the loss, gingwal
hyperbasia, hypertnichosis, and
Peyrone's Disease

Cardiovascular: Periarteritis

nodosa.

Immunologic: Hypersensitivity
syndrome (which may include,
but is not limited to, symptoms
such as arthraigus, eosinophila,
tever, liver dysfunction, lymphadenopathy or rash), systemic lupus erythematosus, and immunoglobulin abnormalities.
OVERDOSAGE: The tethal dose
in children is not known. The

in children is not known. The lethal dose in adults is estimated to be 2 to 5 grams. The initial symptoms are management of the symptoms are management. to be 2 to 5 grams. The initial symptoms are nystagmus, ataxia, and dysarthria. Other signs are tremor, hyperrelleus, lettingry, slurred speech, hausea, voming. The patient may become comatose and hypotensive. Death is due to respiratory and circulatory depression

There are marked variations among individuals with respect to phenyton plasma levels when to provide to provide any occur. Nystagmus on tateral gaze, usually appears at 20 mcg/mL, ataxia at 30 mcg/mL, dysartina and lethargy appear when the plasma concentration is over 40 mcg/mL, but as high a concentration as 50 mcg/mL has here reported without evidence been reported without evidence of toxicity. As much as 25 times the therapeutic dose has been taken to result in a serum con-centration over 100 mcg/ml, with complete recovery.

Treatment: Treatment is nonspecific since there is no known ambdote.

The adequacy of the respirato-ry and circulatory systems should be carefully observed and snould be carefully observed and appropriate supportive measures employed. Hemodalysis can be considered since phenytoin is not completely bound to plasma prosems. Total exchange transfu-sion has been used in the treatmant of severe intoxication in

children
in acute overdosage, the pos-sibility of other CNS depres-sants, including alcohol, should be borne in mind.

DOSAGE AND ADMINISTRA-TION: Serum concentrations should be monitored in changing from extended phenytoin sodium capsules, USP, to prompt phenytom sodium capsules, USP, and from the sodium salt to the free

In acute overcosage, the possibility of other CNS depressants, including alcohol, should be borne in mind. DOSAGE AND ADMINISTRA-

DOSAGE AND ADMINISTRA-TION: Serum concentrations should be monitored in changing from occended prenytoin sodium cassuses. USP: to prompt prenytion sodium cassuses. USP, and home the sodium salt to the free acid term

Extended phenytoin sodium accounts are formulated with the account said of phenytoin. Because there is approximately an 6% encrease in drug content with the free acid form over that of the sodium said, lossage adjustiments and acrum level monitoring—may be inscessary when exercising from a product formulated with the free acid to a product formulated with the residum said and vice versal.

salt and vice versa. General: Dosage should be indidependent to provide maximum benefit. In some cases, serum blood level determinations may be necessary for optimal dosage adjustments — the clinicality effective serum level is usually 10 to 20 mcg/mL. With recommended dosage, a period of seven to ten days may be required to achieve steady-state blood levels with phenytom and changes in dosage (aprezase or decrease) should not be carried out at intervals shorter than seven to ten days.

Adult Dosage: Divided Dalty

Dossays: Patrents-who lever received no previous treatment may be stared on one 100 mg extended phemytom sodium capsule three times daily and the dossage then adjusted to suit individual requirements. For most adults, the satisfaction maintenance dosage will be one capsule three to four times a day. An increase up to two capsules three bines a day may be made if necessary.

most adults, the satistactory maintenance dosage will be one capsule three to four times a day. An increase up to two capsules three bines a day may be made, if necessary.

Once-4-Day Docager: In adults, if seizure control is established with divided doses of three 100 mg extended phenytoin sodium capsules daily once-aday dosage with 300 mg of extended phenytoin sodium capsules may be considered. Studies comparing divided doses of 300 mg with a single daily dose of this quantity indicated absorption, peak plasma fevels, biologic half-life, difference between peak and minimum values, and urnary recovery were equivalent. Once-aday dosage offers a convenience to the individual patient or to nursing personnet for institutionalized patients and is intended to be used only for patients requiring this amount of drug daily. A major problem in motivating noncompliant patients may also be lessened when the patient can lake this drug once a day. However, patients should be cautended ont to miss a dose, madverenty.

Only extended phenyton sodium capsules are recommended for once-a-day dosing, inherent differences in dissolution characteristics and resultant absorption rates of phenytom due to different manufacturing procedures and/or dosage forms proclude such recommendation for other phenytoin products. When a change in the dosage form or brand is prescribed, careful monitoring of phenytoin serum levels should be carried out.

Loading Dass: Some authornies have advocated use of an oral loading dose of phenytion in adults who require rapid steady-state serum levels and where travenous administration is not desirable. This dosing regimen should be reserved for patients in a clinic or nospital setting where phenytion serum levels can be closely monitored. Pacients with a history of real viert disease should not receive the collections are should not receive the collections.

the oral leading regimen. Initially, one gram of phenytonically, one gram of phenytonicapsules is divided into 3 doses (400 mg. 300 mg, 300 mg) and administered at two-hour intervals. Normal maintenance dosage is then instructed 24 hours after the locaing dose, with frequent serum level determinations.

Pediatric Desage: Initially, 5 mg/kg/day in two or three equally divided doses, with subsequent dosage individualized to a maximum of 300 mg daily. A recommended daily maintenance.

toin capsules is divided into doses (400 mg. 300 mg. 300 mg) and administered at two-hour intervals. Normal maintenance dosage is then instituted 24 hours after the loading dose, with frequent serum level determinations.

sentrate 24 hours are use lossing of the with frequent serum were determinations.

Pediatris Desage: Initially, 5 mg/kg/day in two or three equally divided doses, with subsequent dosage individualized to a maximum of 300 mg dairy A recommended dairy maintenance dosage is usually 4 to 8 mg/kg. Children over 6 years old may recours the maximum abuit dose (300 mg/day).

MOW SUPPLIED: Extended Phenytoin Sodium Capsules. USP 100 mg contain 100 mg of phenyton sodium in a light lavender opaque cap and white opaque body, hard-shell gellen capsule shed with one white to off-white capsule-shaped tablet. The capsule is a sually printed with MYLAN over 1560 in black in both the cap and body. They are available as follows:

—NDC 0378-1560-01
—bottles of 100 capsules—STORE AT CONTROLLED ROOM TEMPERATURE 15\* TO 30°C (59°T to 85°F). PROTECT FROM LIGHT AND MOISTRY IDSE

Dispense in a tight, light-resistant container as defined in the LISP using a child-resistant.

MYLAN\*

Mylan Pharmaceuticals Inc. Morgantown, WV 26505

REVISED SEPTEMBER 1998
PHNY:R1